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Produce Related Foodborne Infections: Review of the Centers for Disease Control Foodborne Outbreak Surveillance

**FDA Public Meeting on
Proposed Produce Safety Action Plan
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Public health burden of foodborne disease

- **Each year an estimated 76 million cases (1999 estimate)**
 - **1 in four Americans gets a foodborne illness each year**
 - **1 in 1000 Americans is hospitalized each year**
 - **\$6.5 billion in medical and other costs**
- **Prevention depends on efforts from farm to table to reduce contamination of food**
- **Increasingly recognize a problem in fresh produce**



Foodborne pathogens and their reservoirs

- Infection with a variety of different pathogens
- Each pathogen has a characteristic reservoir
 - Some have a human reservoir: *Shigella*, hepatitis A, Norwalk virus
 - Some have an animal reservoir: *Salmonella*, *Campylobacter*, *E. coli* O157:H7, *Listeria*, *Vibrio*, *Yersinia*, *Toxoplasma*
- Transmitted by several different pathways
 - Foods, water, contact with animals, contact with humans



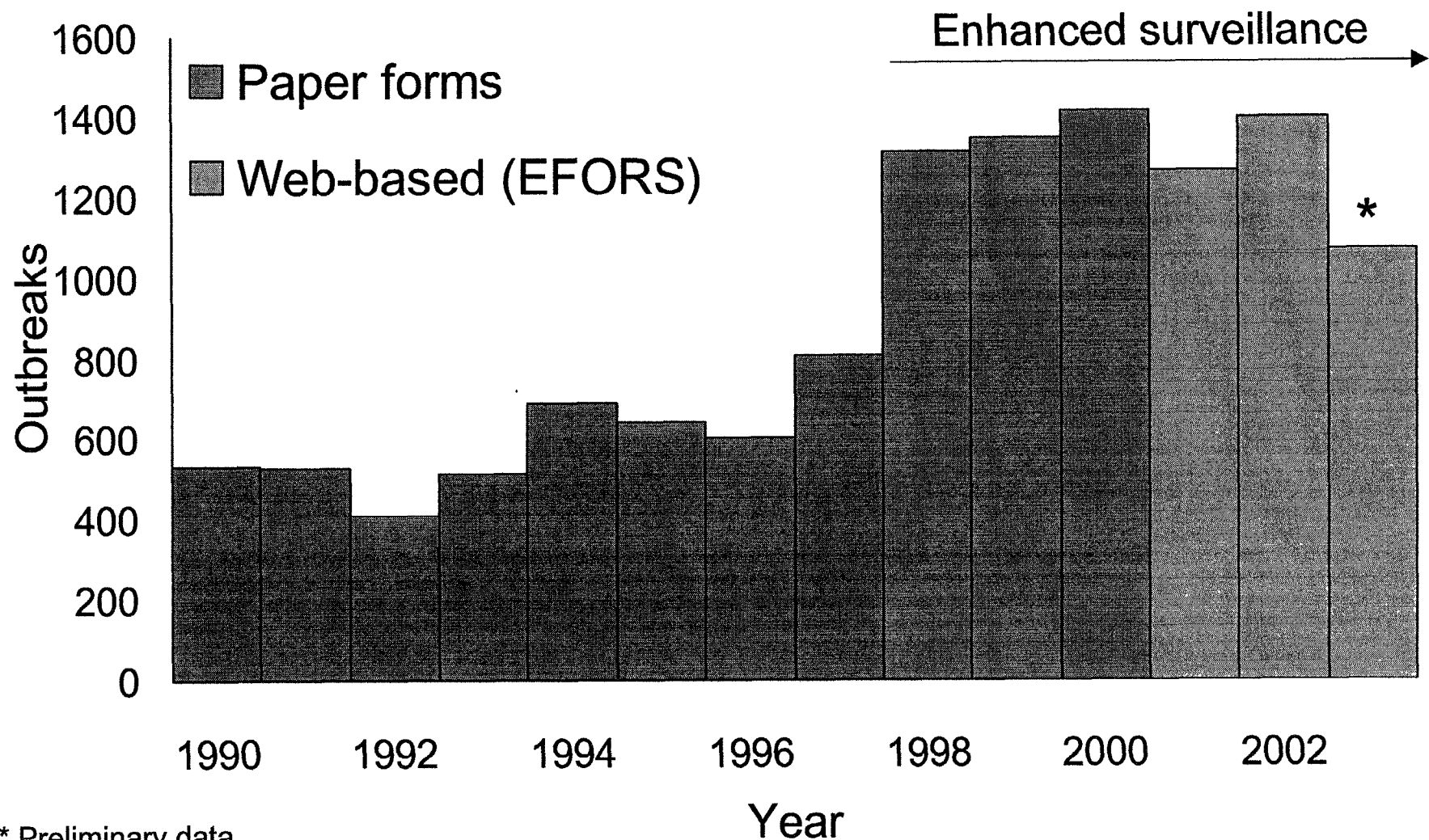
Foodborne outbreak surveillance

- **Most outbreaks detected, investigated and controlled by local and state health departments**

- **CDC collects reports of outbreaks investigated**
 - **Reporting is voluntary and incomplete**
 - **Definition of an outbreak:**
 - 2 or more cases of a similar illness resulting from the ingestion of a common food**
 - **Data collected: No of cases, implicated food, etiology**
 - **Received reports of 400-600/year before 1998**



Foodborne-disease outbreaks reported to CDC, 1990 - 2003¹



* Preliminary data

¹ By states to the Foodborne Disease Outbreak Surveillance System



Foodborne outbreaks related to fresh produce, 1973-1997

- **Fresh produce defined as: uncooked produce items, or “salad” without eggs, cheeses, seafood or meat**
- **1973-1997**
 - **190 foodborne outbreak linked to fresh produce**
 - **16,058 illnesses**
 - **598 hospitalizations**
 - **8 deaths**
- **3.2 % of all outbreaks of determined source**
- **6.2 % of those outbreak-associated cases**



Foodborne outbreaks related to fresh produce, 1973-1997: Trends in burden

	1970's	1990's
Number of outbreaks/yr	2	16
Median cases/outbreak	21	43
% of OB of known vehicle	0.7%	6%
% of outbreak associated cases	0.6%	12%

Foodborne outbreaks related to fresh produce, 1973-1997: Specific food vehicles implicated in 190 outbreaks

➤ **Generic or multiple:** **105 outbreaks**

➤ Lettuce	25	}	88% of outbreaks with one specific vehicle
➤ Melon	13		
➤ Seed sprouts	11		
➤ Apple or orange juice	11		
➤ Berry	9		
➤ Tomato	3		
➤ Green onion	3		
➤ Carrot	2		
➤ Other	8		

Foodborne outbreaks related to fresh produce, 1973-1997: Pathogens identified in 103 (54%) of outbreaks

➤ Bacterial 62:

• <i>Salmonella</i>	30
• <i>E. coli</i> O157	13
• <i>Shigella</i>	10
• <i>Campylobacter</i> 4	
• Other	5

Pathogens with animal reservoir
= 48 outbreaks

➤ Viral 21

• Hepatitis A	12
• Norovirus	9

Pathogens with human reservoir
= 34 outbreaks

➤ Parasite 16

• <i>Cyclospora</i>	8
• Other	8

Pathogens with uncertain
reservoir
= 21 outbreaks

➤ Chemicals 4



Foodborne outbreaks reported to EFORS in 2001*

- **Fresh produce defined in a similar way**
- **57 foodborne outbreak linked to fresh produce**
 - **2,229 illnesses**
 - **81 hospitalizations**
 - **3 deaths**
- **7% of outbreaks with reported food source**
- **11% of outbreak-associated cases**

(*Preliminary information)



Foodborne outbreaks reported to EFORS in 2001: Spectrum of produce implicated in 57 outbreaks

➤ Generic or multiple:	26 outbreaks	
➤ Lettuce:	6	} 45% of outbreaks with single vehicle
➤ Melons:	4	
➤ Tomatoes:	2	
➤ Sprouts:	2	
➤ Apple or orange juice:	0	
➤ Berries:	0	
➤ Other produce items:	17	

(Preliminary information)



Foodborne outbreaks reported to EFORS in 2001: Spectrum of reported etiologies in 46 of 57 produce-associated outbreaks

➤ <u>Bacterial:</u>	<u>17</u>
• <i>Salmonella</i>	10
• <i>Shigella</i>	3
• <i>E. coli</i> O157	1
• Other	3
➤ <u>Viral:</u>	<u>27</u>
➤ <u>Parasitic:</u>	<u>1</u>
➤ <u>Chemical:</u>	<u>1</u>

(Preliminary information)



Conclusions

- **A greater proportion of the burden than in the past**
- **11-12 % of outbreak- associated cases**
- **Both larger outbreaks, and a larger number of outbreaks**
- **Variety of fruits and vegetables
(lettuce, melons, tomatoes, sprouts)**
- **Spectrum of pathogens reflects contamination with human and with animal feces**
- **Both imported and domestically produced**
- **Contamination and amplification can occur from farm to table**

Thank-You



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